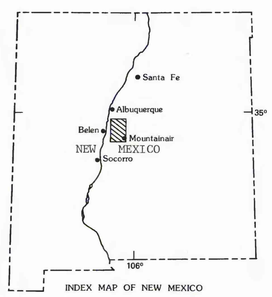
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

MISCELLANEOUS FIELD STUDIES
MAP MF-1464-C
PAMPHLET ACCOMPANIES MAP

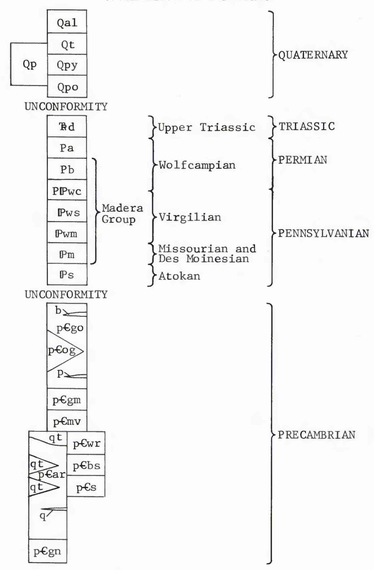
Base from U.S. Geological Survey, 1:24,000, 1954
Bosque Peak, Tajique, Capilla Peak, Torreon,
Tome NE, and Tome SE

Geology modified from Stark, 1956; Myers and McKay, 1971, 1972, 1974



INDEX MAP OF NEW MEXICO

CORRELATION OF MAP UNITS



DESCRIPTION OF MAP UNITS

Qal — ALLUVIUM (QUATERNARY)

Qt — TERRACE DEPOSITS (QUATERNARY)

Qpy — YOUNGER PEDIMENT DEPOSITS (QUATERNARY)

Qpo — OLDER PEDIMENT DEPOSITS (QUATERNARY)

Qp — PEDIMENT DEPOSITS (QUATERNARY)

Rd — DOCKUM(?) GROUP (UPPER TRIASSIC)--Sandstone and shale

Pa — ABO FORMATION (WOLFCAMPIAN)--Siltstone and sandstone

Pb — BURSUM FORMATION (WOLFCAMPIAN)--Sandstone and limestone

WILD COW FORMATION (WOLFCAMPIAN, VIRGILIAN, AND MISSOURIAN)--Sandstone, shale, and limestone

PPwc — La Casa Member--Calcarenite, siltstone, and shale

Pws — Pine Shadow Member--Calcarenite, siltstone, and sandstone

Pwm — Sol se Mete Member--Calcarenite, shale, siltstone, sandstone, and pebble conglomerate

Pm — LOS MOYOS LIMESTONE (MISSOURIAN AND DES MOINESIAN)--Sandstone and limestone

Ps — SANDIA FORMATION (ATOKAN)--Conglomerate, sandstone, and limestone

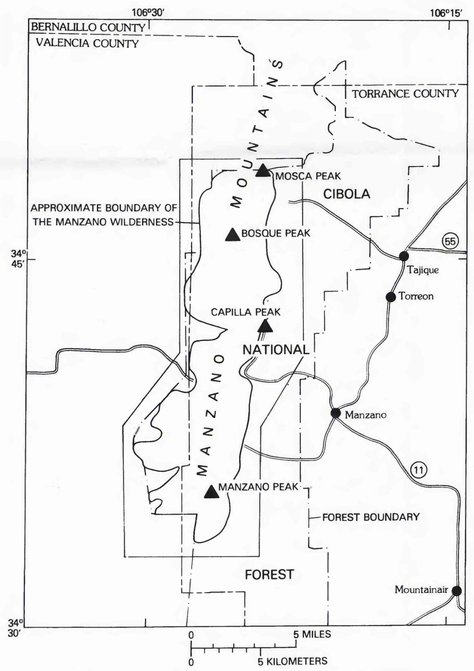
p€go — GRANODIORITE OF OJITO STOCK OF REICHE, 1949 (PRECAMBRIAN)

p€og — Olivine gabbro to hornblende diorite

b — Altered basalt dikes

p — Pegmatite dikes

p€gm — MONTE LARGO GRANITE OF STARK, 1956 (PRECAMBRIAN)



INDEX MAP SHOWING LOCATION OF THE MANZANO WILDERNESS

p€m — METAVOLCANIC ROCKS OF BIMODAL COMPOSITION (PRECAMBRIAN)

p€wr — WHITE RIDGE QUARTZITE OF STARK AND DAPPLES, 1946 (PRECAMBRIAN)

p€bs — BLUE SPRINGS SCHIST OF STARK AND DAPPLES (PRECAMBRIAN)

p€s — SAIS QUARTZITE OF STARK AND DAPPLES (PRECAMBRIAN)

p€ar — ARGILLACEOUS METASEDIMENTARY ROCKS, UNDIVIDED (PRECAMBRIAN)

qt — Quartzite

q — Quartz veins

p€gn — GREENSTONE COMPLEX OF REICHE, 1949 (PRECAMBRIAN)--Schist, phyllite, and conglomerate

X — PROSPECT PIT OR MINE

AREA SHOWING MODERATE POTENTIAL FOR GOLD DEPOSITS

AREA SHOWING LOW POTENTIAL FOR GOLD DEPOSITS

1 — LOCALITIES DISCUSSED IN TEXT

CONTACT--Dashed where approximately located

NORMAL FAULT--Dashed where approximately located, dotted where concealed. Bar and ball on downthrown side

REVERSE FAULT--Dashed where approximately located, dotted where concealed. Sawteeth on upthrown side

BRECCIATED FAULT ZONE

ANTICLINE--Showing trace of axis and direction of plunge

SYNCLINE--Showing trace of axis and direction of plunge

STRIKE AND DIP OF BEDS

20 — Inclined

Vertical

60 — Overturned

STRIKE AND DIP OF FOLIATION

85 — Inclined

Vertical

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Manzano Wilderness, in the Cibola National Forest, Valencia and Torrance Counties, N. Mex. The Manzano Wilderness was established by Public Law 95-237, February 24, 1978.

MINERAL RESOURCE POTENTIAL
SUMMARY STATEMENT

As indicated by the presence of identified gold and silver mineral occurrences in the canyon there is a moderate potential for a small deposit averaging as much as 0.1 oz gold and 1 oz silver per ton in the Bartolo Canyon area. A low potential is indicated for additional small gold and silver deposits in an area of similar geology along the southwest boundary of the wilderness. No indications of significant mineral occurrences were found elsewhere in the wilderness. The few anomalies found in stream-sediment and outcrop analyses were for samples from widely separated localities and in amounts too low to indicate a resource potential.

INTRODUCTION

A mineral survey of the Manzano Wilderness, N. Mex., was made in 1979-1981 by the U.S. Geological Survey and the U.S. Bureau of Mines. The wilderness, established in 1978, consists of about 55 sq mi (37,000 acres) in the Mountainair Ranger District of the Cibola National Forest. It is in the Manzano Mountains about 30 mi south-southeast of Albuquerque, along the boundary of Torrance and Valencia Counties (see index map). Elevations range from about 6,000 ft above sea level along the western base of the mountains to a maximum of 10,098 ft on Manzano Peak; the crest of the mountains is generally about 9,000 ft. Topographic relief ranges from about 1,600 ft to 2,400 ft per mile over most of the range. Access to the periphery of the wilderness is provided by unimproved dirt roads and jeep trails along most of the western and southeastern parts of the area, and by four improved dirt and gravel roads, one to the John F. Kennedy Campground in Cañon del Trigo on the west-central boundary, one to Red Canyon picnic area on the southeast side, one to the top of Capilla Peak, and the Torreon-Tajique loop road near the northeast boundary.

GEOLOGY

The Manzano Mountains, part of the uplifted eastern margin of the Rio Grande trench, are an eastward-dipping, fault-block mountain range with a core of complexly deformed Precambrian rocks overlain by Pennsylvanian sedimentary rocks. The Manzano Wilderness is land that is largely underlain by Precambrian rocks. It includes much of the mountain crest and steep, west-facing slopes and some of the east-facing slopes in the southern part of the Manzanos.

The geologic report and map in this series are adapted from the work of Reiche (1949), Stark (1956), Myers and McKay (1971, 1972, 1974), and Condie and Budding (1979), supplemented by some additional geologic mapping and by geochemical sampling of selected stream deposits, mineralized areas, bedrock, and panned concentrates from some major drainages (Maxwell and Wobus, 1982a).

GEOPHYSICS

An aeromagnetic map (Maxwell and Wobus, 1982b) showing the total-intensity magnetic field of the wilderness indicates a high magnetic ridge corresponding to the outcrop area of metavolcanic rocks (p€mv) and its subsurface projection, and a magnetic trough following the outcrop pattern of argillaceous metasedimentary rocks (p€ar). A prominent anomalous high is centered over a quartzite layer or over an unconformity or fault zone northwest of Comanche Canyon. This anomaly appears to be relatively shallow, apparently not related to the intrusives of granodiorite and gabbro of the Ojito stock, and might represent only a local increase in the abundance of magnetic minerals in the metasedimentary rocks. A gravity map (Maxwell and Wobus, 1982b) indicates no anomaly or change in the gravity profile in the vicinity of the magnetic anomaly.

GEOCHEMISTRY

Major ephemeral streams and some tributaries were sampled, and panned concentrates were taken along the largest streams. Representative bedrock samples were collected, and all areas of detected altered or mineralized rock were sampled. Selected high-grade samples of the most highly mineralized rock found on mine and prospect dumps and chip-channel samples across veins and mineralized areas in mines were analyzed.

A total of 237 samples were collected in or near the Manzano Wilderness, of which 109 were dry stream-sediment samples, 19 were panned concentrates, 23 were outcrop samples, and 86 were chip-channel and grab samples from mines and prospects. Chip-channel samples ranged from 1.5 to 6 ft long, and were taken across veins and mineralized zones in mine workings. Analytical results were published in Maxwell and Wobus (1982b) and in Light (1982).

Gold in very small amounts was detected in several stream-sediment and rock samples, but only four samples contained more than 1 ppm, one sample each of stream sediments from Comanche and Diablo Canyons and of rock and vein material from a small canyon south of Cañon del Trigo and from Ojito Canyon. Silver was detected in several samples, but in amounts less than 1 ppm; other elements were also found in anomalous concentrations, but none appear to indicate the presence of mineral deposits.

MINING DISTRICTS AND MINERALIZATION

The Manzano Wilderness does not lie within a recognized mining district, but has been referred to as part of the Scholle or Manzano district. At least 25 mines and prospects occur in and adjacent to the wilderness; most of them are in the vicinities of Bartolo Canyon (loc. 1), Cañon Monte de Abajo (loc. 4), Priest Canyon (loc. 5), and Cañon de Salas (loc. 2).

Workings in the Bartolo Canyon area consist of three adits driven 15, 18, and 175 ft, and several prospect pits. Numerous samples taken across faults within these abandoned workings contained anomalously high gold, silver, or copper values.

In Cañon de Salas, about 1 mi north of the adits in Bartolo Canyon, there is a 20-foot-long open cut and a 10-foot-long adit. Two of the three samples from this fault contained 0.4 oz silver per ton, but no other metal in anomalous concentrations.

About 1 mi north of Cañon Monte de Abajo, between Cañon Monte Largo and Cañon Monte de Abajo, are the Cordova prospect (loc. 3) and an unnamed adit 0.7 mi east of it (loc. 4). Two samples from Cordova workings contained 0.4 oz silver per ton. The adit at locality 4 has 200 ft of underground workings; several samples from the workings contained anomalously high copper values; the maximum was 0.84 percent.

Prospects near the southeastern boundary of the wilderness (around loc. 5) have anomalous concentrations of silver (0.4 oz per ton) and copper (0.78 percent).

No significant mineral occurrences were found elsewhere in the wilderness.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

The major part of the Manzano Wilderness is considered to have a low potential for the occurrence of metallic mineral resources. A small area along the southwest boundary of the wilderness has a low to moderate potential for small deposits of gold and silver.

Although oil and gas leases are located adjacent to the wilderness, the bedrock of the wilderness is predominantly Precambrian metamorphic terrane, which seems to preclude oil and gas occurrences.

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SCALE 1:50 000

1 ½ 0 1 2 3 MILES

1 .5 0 1 2 3 KILOMETERS

MINERAL RESOURCE POTENTIAL MAP OF THE MANZANO WILDERNESS, VALENCIA AND TORRANCE COUNTIES, NEW MEXICO

By

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1983

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